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Before the Board of Patent Appeals and Interferences

In re the Application

Inventor	**:**	**Tu et al.**
Application No.	**:**	**10/540,189**
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For	**:**	**Computer Input Device Utilizing Three-Dimensional Space**

APPEAL BRIEF

On Appeal from Group Art Unit 2629

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I. REAL PARTY IN INTEREST

The real party in interest is the assignee of the present application, Koninklijke Philips Electronics N.V., and not the party named in the above caption.

II. RELATED APPEALS AND INTERFERENCES

With regard to identifying by number and filing date all other appeals or interferences known to Appellant which will directly effect or be directly affected by or have a bearing on the Board's decision in this appeal, Appellant is not aware of any such appeals or interferences.

III. STATUS OF CLAIMS

Claims 15-28 are all the claims pending in the application, claims 1-14 having been cancelled without prejudice or disclaimer of subject matter. Claims 15-28 stand finally rejected and are the subject of this appeal. In particular, independent claims 15, 16, 19, 22, 23 and 26 stand rejected under 35 USC 102(b) as being anticipated by Glynn, U.S. Patent No. 5,181,181 (Hereinafter "Glynn"). Claims 17, 18, 20, 21, 24, 25, 27 and 28 stand rejected under 35 USC 103(a) as being obvious over Glynn in view of Bartlett, U.S. Patent No. 6,347,290.

IV. STATUS OF AMENDMENTS

In the Advisory Action dated February 24, 2009, the examiner indicated that the amendment filed February 4, 2009, would be entered for appeal and that the rejection of the claims would remain as stated in the final Office Action dated December 10, 2008.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The present invention is expressed primarily in independent claims 15, 19, 22 and 26. Claim 15 recites an input device (item 20, Fig. 1), which comprises a motion detection sensor (item 22, Fig. 1) that is configured to generate three-dimensional (3D) motion data on first, second and third axes, associated with 3D movement of the input device. The device further includes a means for transmitting the motion data (e.g., Bluetooth, Zigbee, IEEE 802.11, infrared; as recited in [0018]) to a computer (item 30, Fig. 1); and a means (item 32, Fig. 1 and [0018]) for causing the computer to derive a distance and direction of the movement of the input device in a two-dimensional (2D) plane based on the motion data on the first and second axes. The device also includes a means for causing the computer to determine whether the motion data on the third axis is greater than a first predetermined value (item 112; Fig. 6 and paragraphs [0025]-[0026]); and a means for causing the computer to move a cursor to a corresponding position based on the distance and direction derived in the 2D plane, upon the computer determining the

motion data on the third axis is greater than the first predetermined value (paragraph [0023]).

Independent claim 19 recites a computer-readable media tangibly embodying a program of instructions executable by a computer (item 30, Fig. 1) to perform a method of controlling a cursor of the computer in response to operation of an input device (item 20, Fig. 1), the method comprising the steps of: receiving three-dimensional (3D) motion data on first, second and third axes, associated with 3D movement of the input device (item 102, Fig. 6); and deriving a distance and direction of the movement of the input device in a two-dimensional (2D) plane based on the motion data on the first and second axes [paragraph [0022]). The method further comprises determining whether the motion data on the third axis is greater than a first predetermined value (item 112, Fig. 6); and moving a cursor of the computer to a corresponding position based on the distance and direction derived in the 2D plane, upon determining the motion data on the third axis is greater than the first predetermined value (paragraph [0023]).

Independent claim 22 recites a computer system comprising an input device (item 20, Fig. 1) including a motion detection sensor (item 22, Fig. 1) that is configured to generate three-dimensional (3D) motion data on first, second and third axes, associated with 3D movement of the input device, and a means for transmitting the motion data (e.g., Bluetooth, Zigbee, IEEE 802.11, infrared; as recited in [0018]) to a

computer (item 30, Fig. 1). The computer system further comprises a computing device including a means (item 32, Fig. 1 and [0018]) for deriving a distance and direction of the movement of the input device in a two-dimensional (2D) plane based on the motion data on the first and second axes, a means for determining whether the motion data on the third axis is greater than a first predetermined value (item 112, Fig. 6 and paragraphs [0025]-[0026]), and a means for moving a cursor to a corresponding position based on the distance and direction derived in the 2D plane, if the motion data on the third axis are greater than the first predetermined value (paragraph [0023]).

Independent claim 26 recites a method for controlling a cursor of a computer (item 30, Fig. 1) in response to operation of an input device (item 20, Fig. 1), the method comprising the steps of: receiving three-dimensional (3D) motion data on first, second and third axes, associated with 3D movement of the input device (item 102, Fig. 6); and deriving a distance and direction of the movement of the input device in a two-dimensional (2D) plane based on the motion data on the first and second axes [paragraph [0022]). The method further comprises determining whether the motion data on the third axis is greater than a first predetermined value (item 112, Fig. 6); and moving a cursor of the computer to a corresponding position based on the distance and direction derived in the 2D plane, if the motion data on the third axis is greater than the first predetermined value (paragraph [0023]).

The remaining claims, which depend from respective independent claims, express further aspects of the invention.

VI. GROUNDS FOR REJECTION TO BE REVIEWED ON APPEAL

The issue in the present matter is whether:

1. Claims 15, 16, 19, 22, 23 and 26 were properly rejected under 35 USC 102(b) as being anticipated by Glynn, U.S. Patent No. 5,181,181 (Hereinafter "Glynn").
2. Claims 17, 18, 20, 21, 24, 25, 27 and 28 were properly rejected under 35 USC 103(a) as being obvious over Glynn in view of Bartlett, U.S. Patent No. 6,347,290.

VII. ARGUMENT

A. The Glynn patent fails to anticipate claims 15, 16, 19, 22, 23 and 26 under 35 USC §102(b)

The present invention provides an input device that gives users more flexibility and convenience by allowing them to move the input device in a three-dimensional space without requiring any flat surface. An example of the usefulness of this device would be that it permits an individual giving a lecture to move about the lecture room and input to a computer without having to return to the location of the computer's mouse.

In particular, claim 15 (with paragraph designations added for reference in arguments below) recites:

An input device, comprising:

[a] a motion detection sensor that is configured to generate three-dimensional (3D) motion data on first, second and third axes, associated with 3D movement of the input device;

[b] means for transmitting the motion data to a computer;

[c] means for causing the computer to derive a distance and direction of the movement of the input device in a two-dimensional (2D) plane based on the motion data on the first and second axes;

[d] means for causing the computer to determine whether the motion data on the third axis is greater than a first predetermined value; and

[e] means for causing the computer to move a cursor to a corresponding position based on the distance and direction derived in the 2D plane, upon the computer determining the motion data on the third axis is greater than the first predetermined value.

As recited in claim 15 and described in paragraphs [0026] and [0027] of the published application, the input device determines a distance and direction of its movement in a 2D plane. However, the corresponding computer cursor movement occurs only if "the motion data on the third axis is greater than a first predetermined value" (claim 15, last two lines). While this claim language is quite clear, further evidence of what was intended is found in the specification:

> "A determination is made as to whether the movement along the z axis is greater than a predetermined absolute value z_{min} (e.g., 3 cm) (step 112). If the determination is negative, it indicates that cursor action is not intended" [0026].

Glynn et al. teaches "a mouse which senses six degrees of motion arising from movement of the mouse within three dimensions. A hand-held device includes three accelerometers for sensing linear translation along three axes of a Cartesian coordinate system and three angular rate sensors for sensing angular rotation about the three axes. Signals produced by the sensors are processed to permit the acceleration, velocity and relative position and attitude of the device to be conveyed to a computer. Thus, a person may interact with a computer with six degrees of motion in three-dimensional space" (Glynn Abstract). Glynn's invention attempts to address shortcomings in the prior art with respect to "the definition of positional coordinates in three dimensions" (col. 1, lines 47-48). Glynn further states: "It is another object of the present invention to provide a new and improved apparatus and method for controlling movement of a cursor, represented on a computer display in terms of three-dimensional spatial coordinates" (col. 2, lines 56-61).

The present invention, as defined by independent claim 15, is clearly distinguishable from the teachings of Glynn. In particular, while the input device of the current invention recognizes 3-dimensional movement, it does not do so with an intent to move a 3-dimensional cursor or in anyway interact with a computer representation in 3-dimensional space.

In the rejection of claim 15, Paragraph 4 of the Office Action combines the teachings of col. 7 lines 21-33 of Glynn with those of col. 10, lines 43-50 to address the features of the invention whereby movement in a 2-dimensional plane is utilized only if movement in a third dimension exceeds a threshold. For the reasons given below, Appellants submit Glynn fails to teach this feature of the claimed invention.

The Office Action points to col. 7, lines 44-50 as teaching the feature of claim 15 of a "means for causing the computer to determine whether the motion data on the third axis is greater than a first predetermined value." This cited passage relates to "errors which might be induced by sensor drift, earth rotational effects and low level noise signals that may be present when an operator is not moving the mouse" (col. 7, lines 48-50). Accordingly, when Glynn recites a threshold level for "motion signal**s** [emphasis added]," he clearly intends a combination of signals in various dimensions, as the types of errors noted above are not intended to be limited to a threshold comparison of motion data of one axis alone. Moreover, Glynn fails to teach the claim feature whereby a single axis threshold determination is used as a trigger for cursor movement that corresponds to detected motion measurements related to the other two dimensions.

The above argument was presented in response to the April 29, 2008 Office Action. The response to this argument given in the December 10, 2008 Office Action includes the statement "the claim [claim 15] does not limit to **only** [emphasis in original] a single axis threshold, as the applicant stated" (at page 6, 3rd full paragraph). While it is true that in

the present invention, if no motion is detected in the 2D plane (claim element [c]), no resulting cursor movement occurs. However, claim 15 goes beyond that in stating even when motion is detected in the 2D plane, a corresponding cursor movement occurs "upon the computer determining the motion data on the third axis is greater than the first predetermined value." That is, detected distance in the 2D plane does not result in any cursor movement unless there is detected sufficient 3rd axis movement.

Glynn fails to teach this feature. In Glynn, motion in an x-y plane (a 2D plane) will cause the cursor to move (Fig. 7 process 3.3; col. 10, lines 43-50) -- even if no motion is detected in the z-dimension. Thus Glynn not only lacks the feature of claim 15 where detected z-dimension motion acts as a trigger, but in fact teaches away from it (cursor movement will occur when no motion is detected in the z-dimension).

The next to last paragraph of the February 24, 2009 Advisory Action states "The [above] arguments is [*sic*] not supported by what is claimed in claim 15." Appellants respectfully disagree. Claim 15 recites how three dimension motion data is obtained with respect to three axes. Data with respect a two dimensional plane is derived based on motion data of two of these axes (element c). Motion data of the third axes is compared against a threshold (element d). Cursor movement then occurs upon that threshold being exceeded (element e). Appellants respectfully submit that the above arguments relate to the language of claim 15.

For at least the reasons stated above, Glynn fails to teach the feature of claim 15 wherein an input device comprises a means for causing the computer to determine whether the motion data on the third axis is greater than a first predetermined value; and means for causing the computer to move a cursor to a corresponding position based on the distance and direction derived in the 2D plane, upon the computer determining the motion data on the third axis is greater than the first predetermined value.

A claim is anticipated only if each and every element recited therein is expressly or inherently described in a single prior art reference. Glynn cannot be said to anticipate the present invention, because Glynn fails to disclose each and every element recited. As shown, Glynn fails to disclose movement of a cursor in 2-dimensional space that is contingent upon a result of a threshold comparison of movement of the device along a third axis. Independent claims 19, 22 and 26 contain similar features and each is patentable over Glynn for at least the same reasons.

Having shown that Glynn fails to disclose each and every element claimed, Appellants submit that claims 15, 19, 22 and 26 are allowable over Glynn. Appellants respectfully request reconsideration, withdrawal of the rejection and allowance of claims 15, 19, 22 and 26.

B. That the combination of Glynn and Bartlett fails to render Claims 17, 18, 20, 21, 24, 25, 27 and as being obvious under 35 USC 103(a)

With regard to claims 16-18, 20-28, 23-25 and 27, these claims ultimately depend from one of the independent claims, which have been shown to be not anticipated and allowable in view of the cited references. Appellants respectfully submit that these remaining dependent claims are allowable at least for their dependence upon allowable base claims, without even contemplating the merits of the dependent claims for reasons analogous to those held in *In re Fine,* 837 F.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988) (if an independent claim is non-obvious under 35 U.S.C. §103(a), then any claim depending therefrom is non-obvious).

VIII. CONCLUSION

In view of the above analysis, it is respectfully submitted that the referenced teaching fails to render unpatentable or anticipate the subject matter of any of the present claims. Therefore, reversal of all outstanding grounds of rejection is respectfully solicited.

Respectfully submitted,
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Date: May 4, 2009

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VIII. CLAIMS APPENDIX

The claims which are the subject of this Appeal are as follows:

Claims 1-14 (canceled)

15. An input device, comprising:

a motion detection sensor that is configured to generate three-dimensional (3D) motion data on first, second and third axes, associated with 3D movement of the input device;

means for transmitting the motion data to a computer;

means for causing the computer to derive a distance and direction of the movement of the input device in a two-dimensional (2D) plane based on the motion data on the first and second axes;

means for causing the computer to determine whether the motion data on the third axis is greater than a first predetermined value; and

means for causing the computer to move a cursor to a corresponding position based on the distance and direction derived in the 2D plane, upon the computer determining the motion data on the third axis is greater than the first predetermined value.

16. The device of claim 15, wherein the transmitting means wirelessly transmits the motion data.

17. The device of claim 15, further comprising:

means for causing the computer to determine whether the motion data on the first and second axes are greater than second and third pre-determined values, respectively; and

means for causing the computer to perform a left click operation, upon the computer determining either the motion data on the first axis are greater than the second predetermined value or the motion data on the second axis are greater than the third predetermined value.

18. The device of claim 17, further comprising:

means for causing the computer to determine whether a time interval is greater than a predetermined duration, the time interval being between the motion data on the third axis being greater than the first predetermined minimum value and the motion data on the first axis being greater than the second predetermined value or the motion data on the second axis being greater than the third predetermined value;

means for performing a drag operation upon the computer determining the time interval is greater than the predetermined duration; and

means for performing a right click operation upon the computer determining the time interval is not greater than the predetermined duration.

19. Computer-readable media tangibly embodying a program of instructions executable by a computer to perform a method of controlling a cursor of the computer in response to operation of an input device, the method comprising the steps of:

receiving three-dimensional (3D) motion data on first, second and third axes, associated with 3D movement of the input device;

deriving a distance and direction of the movement of the input device in a two-dimensional (2D) plane based on the motion data on the first and second axes;

determining whether the motion data on the third axis is greater than a first predetermined value; and

moving a cursor of the computer to a corresponding position based on the distance and direction derived in the 2D plane, upon determining the motion data on the third axis is greater than the first predetermined value.

20. The media of claim 19, wherein the method further comprises:

determining whether the motion data on the first and second axes are greater than second and third pre-determined values, respectively; and

performing a left click operation, upon determining either the motion data on the first axis are greater than the second predetermined value or the motion data on the second axis are greater than the third predetermined value.

21. The media of claim 20, further comprising:

determining whether a time interval is greater than a predetermined duration, the time interval being between the motion data on the third axis being greater than the first predetermined minimum value and the motion data on the first axis being greater than the second predetermined value or the motion data on the second axis being greater than the third predetermined value;

performing a drag operation, upon determining the time interval is greater than the predetermined duration; and

performing a right click operation, upon determining the time interval is not greater than the predetermined duration.

22. A computer system, comprising:

an input device including:

a motion detection sensor that is configured to generate three-dimensional (3D) motion data on first, second and third axes, associated with 3D movement of the input device, and

means for transmitting the motion data to a computer; and

a computing device including:

means for deriving a distance and direction of the movement of the input device in a two-dimensional (2D) plane based on the motion data on the first and second axes,

means for determining whether the motion data on the third axis is greater than a first predetermined value, and

means for moving a cursor to a corresponding position based on the distance and direction derived in the 2D plane, if the motion data on the third axis are greater than the first predetermined value.

23. The system of claim 22, wherein the transmitting means wirelessly transmits the motion data.

24. The system of claim 22, wherein the computing device further comprises:

means for determining whether the motion data on the first and second axes are greater than second and third pre-determined values, respectively, and

means for performing a left click operation, if either the motion data on the first axis are greater than the second predetermined value or the motion data on the second axis are greater than the third predetermined value.

25. The system of claim 24, wherein the computing device further comprises:

means for determining whether a time interval is greater than a predetermined duration, the time interval being between the motion data on the third axis being greater than the first predetermined minimum value and the motion data on the first axis being greater than the second predetermined value or the motion data on the second axis being greater than the third predetermined value,

means for performing a drag operation, if the time interval is greater than the predetermined duration, and

means for performing a right click operation, if the time interval is not greater than the predetermined duration.

26. A method for controlling a cursor of a computer in response to operation of an input device, the method comprising the steps of:

receiving three-dimensional (3D) motion data on first, second and third axes, associated with 3D movement of the input device;

deriving a distance and direction of the movement of the input device in a two-dimensional (2D) plane based on the motion data on the first and second axes;

determining whether the motion data on the third axis is greater than a first predetermined value; and

moving a cursor of the computer to a corresponding position based on the distance and direction derived in the 2D plane, if the motion data on the third axis is greater than the first predetermined value.

27. The method of claim 26, further comprising:

determining whether the motion data on the first and second axes are greater than second and third pre-determined values, respectively; and

performing a left click operation, if either the motion data on the first axis are greater than the second predetermined value or the motion data on the second axis are greater than the third predetermined value.

28. The media of claim 20, further comprising:

determining whether a time interval is greater than a predetermined duration, the time interval being between the motion data on the third axis being greater than the first predetermined minimum value and the motion data on the first axis being greater than the second predetermined value or the motion data on the second axis being greater than the third predetermined value;

performing a drag operation, if the time interval is greater than the predetermined duration; and

performing a right click operation, if the time interval is not greater than the predetermined duration.

X. EVIDENCE APPENDIX

No further evidence is provided.

XI. RELATED PROCEEDING APPENDIX

No related proceedings are pending and, hence, no information regarding same is available.